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CLAIMS

1. A switchable coupler in which:-

a first waveguide defines

5 an inlet port for a first unpolarised light input and
a first outlet port,

a second waveguide defines

an inlet port for a second unpolarised light input and
a second outlet port,

10 a polarisation splitter device is positioned between the
waveguides to split the first unpolarised light input and the second
unpolarised light input into respective refracted and reflected
polarised components,

the waveguides are arranged to transmit

15 the refracted and reflected polarised components of the first
light input by total internal reflection in the direction of the
first outlet port, and

the refracted and reflected polarised components of the
second light input by total internal reflection in the direction
20 of the second outlet port,

a first electro-optical switch is positioned in the paths of the
refracted and reflected polarised components of the first light
input,

the first electro-optical switch is operable to recombine the
25 refracted and reflected polarised components of the first light input
and to switch these combined components towards the second
outlet port,

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a second electro-optical switch is positioned in the paths of the refracted and reflected polarised components of the second light input, and

5 the second electro-optical switch is operable to recombine the refracted and reflected polarised components of the second light input and to switch these combined components to the first outlet port.

10 2. A switchable coupler, according to Claim 1, in which the polarisation splitter device includes liquid crystal positioned between the waveguides.

3. A switchable coupler, according to Claim 2, in which the liquid crystal defines two separate cells, one liquid crystal cell serving to split the first unpolarised light input, and the other liquid crystal cell serving to split the second unpolarised light input.

15 4. A switchable coupler, according to any preceding claim in which the, or each, electro-optical switch includes liquid crystal positioned between the waveguides, and an electric field device is provided to generate an electric field across the liquid crystal to operate the electro-optical switch, or switches.

20 5. A switchable coupler, according to Claim 4, in which the liquid crystal defines two separate cells, one of these liquid crystal cells forming part of each electro-optical switch.

6. A method of coupling first and second inputs of unpolarised light comprising:-

25 splitting the first and second inputs into respective refracted and reflected polarised components,

transmitting the refracted and reflected components of the first input to a first electro-optical switch operable to recombine the refracted and reflected components of the first input and to switch
30 the recombined output from a first outlet to a second outlet,

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transmitting the refracted and reflected components of the second input to a second electro-optical switch operable to recombine the refracted and reflected components of the second input and to switch the recombined output from the second outlet to the first outlet, and

selecting the operation of the first and second electro-optical switches to couple the first and second inputs into either the first outlet or the second outlet.